SECTION 3. STANDARD URBAN STORM WATER MITIGATION PLAN (SUSMP)

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I. Background

The National Pollutant Discharge Elimination System (NPDES) Municipal Permit (Order No. R9-2007-0001, NPDES No. CAS0108758), hereinafter referred to as "Municipal Permit" issued to San Diego County, the Port of San Diego, San Diego County Regional Airport Authority and 18 cities (Copermittees) by the San Diego Regional Water Quality Control Board (Regional Board) on January 24, 2007, requires the development and implementation of a program addressing urban runoff pollution issues in development planning for public and private projects.

The requirement to implement a program for development planning is based on federal and state statutes including: Section 402 (p) of the Clean Water Act; Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 ("CZARA"); and, the California Water Code. The Clean Water Act amendments of 1987 established a framework for regulating urban runoff discharges from municipal, industrial, and construction activities under the NPDES program. The Municipal Permit requires the implementation of a Jurisdictional Urban Runoff Management Program (JURMP). The primary objectives of the JURMP requirements are to:

1. Ensure that discharges from municipal urban runoff conveyance systems do not cause or contribute to a violation of water quality standards;
2. Effectively prohibit non-storm water discharges in urban runoff; and,
3. Reduce the discharge of pollutants from urban runoff conveyance systems to the Maximum Extent Practicable (MEP statutory standard).

The Standard Urban Storm Water Mitigation Plan (SUSMP) requirements of this section apply to all private and public development and redevelopment projects in the City of Chula Vista that meet the definition of Priority Development Projects described in Section D.1.d.(1) of the Municipal Permit, as quoted below:

"D.1.d.(1) Definition of Priority Development Project

(a) Priority Development Projects are: a) all new Development Projects that fall under the project categories or locations listed in section D.1.d.(2), and b) those redevelopment projects that create, add or replace at least 5,000 square feet of impervious surfaces on an already developed site that falls under the project categories or locations listed in section D.1.d.(2). Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to SUSMP requirements, the numeric sizing criteria discussed in section D.1.d.(6)(c) applies only to the addition, and not

the entire development. Where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the numeric sizing criteria applies to the entire development. Where a new Development Project feature, such as a parking lot, falls into a Priority Development Project Category, the entire project footprint is subject to SUSMP requirements.

(b) In addition to the Priority Development Project Categories identified in Section D.1.d.(2), within three years of adoption of this Order Priority Development Projects shall also include all other pollutant generating Development Projects that result in the disturbance of one acre or more of land.[4] As an alternative to this one acre threshold, the Copermittees may collectively identify a different threshold, provided the Copermittees' threshold is at least as inclusive of Development Projects as the one acre threshold.

[4]Pollutant generating Development Projects are those projects that generate pollutants at levels greater than background levels.

D.1.d.(2) Priority Development Project Categories

(a) Housing subdivisions of 10 or more dwelling units. This category includes single-family homes, multi-family homes, condominiums, and apartments.

(b) Commercial developments greater than one acre. This category is defined as any development on private land that is not for heavy industrial or residential uses where the land area for development is greater than one acre. The category includes, but is not limited to: hospitals; laboratories and other medical facilities; educational institutions; recreational facilities; municipal facilities; commercial nurseries; multi-apartment buildings; car wash facilities; mini-malls and other business complexes; shopping malls; hotels; office buildings; public warehouses; automotive dealerships; airfields; and other light industrial facilities.

(c) Developments of heavy industry greater than one acre. This category includes, but is not limited to, manufacturing plants, food processing plants, metal working facilities, printing plants, and fleet storage areas (bus, truck, etc.).

(d) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(e) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet. Restaurants where land development is less than 5,000 square feet shall meet all SUSMP requirements except for structural treatment BMP and numeric sizing criteria requirement D.1.d.(6)(c) and hydromodification requirement D.1.g.

(f) All hillside development greater than 5,000 square feet. This category is defined as any development which creates 5,000 square feet of impervious surface which is located in an areas with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(g) Environmentally Sensitive Areas (ESAs). All development located within or directly adjacent to or discharging directly to an ESA (where discharges from the development or redevelopment will enter receiving waters within the ESA), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition. "Directly adjacent" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.

(h) Parking lots 5,000 square feet or more or with 15 or more parking spaces and potentially exposed to urban runoff. Parking lot is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(i) Street, roads, highways, and freeways. This category includes any paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(j) Retail Gasoline Outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day."

II. Summary

The City of Chula Vista SUSMP is based on a Model SUSMP developed collectively by the Copermittees to address post-construction urban runoff pollution from new

development and redevelopment projects that fall under "Priority Development Project" categories. The Model SUSMP was approved by the Regional Board on June 12, 2002. The current SUSMP is an update of the previous City of Chula Vista SUSMP, dated November 18, 2002, and is intended to develop and implement practicable policies to ensure to the maximum extent practicable that development does not increase pollutant loads from a project site and considers urban runoff flow rates, velocities, and durations. This goal may be achieved through site-specific controls and/or drainage area-based or shared structural treatment controls.

This SUSMP identifies appropriate Best Management Practices (BMPs) for certain designated project types to achieve this goal. In particular, this SUSMP requires the implementation of Low Impact Development (LID) principles and features throughout Priority Development Projects, and limits the use of low efficiency treatment control BMPs. Under this SUSMP, the City of Chula Vista will approve the SUSMP project plan(s) as part of the development plan approval process for discretionary projects, and prior to issuing permits for ministerial projects. To allow flexibility in meeting SUSMP design standards, structural treatment control BMPs may be located on- or off-site, used singly or in combination, or shared by multiple developments, provided that the BMPs address pollutants of concern identified for the project or projects and as approved by the City Engineer on a project-by-project basis.

Applicants must incorporate all necessary permanent BMPs into the project plans prior to submittal, regardless of project type. In addition, projects subject to Priority Development Project (SUSMP) requirements must prepare and submit a Water Quality Technical Report (WQTR) in accordance with Section 4 of this Manual. Analysis of the project's anticipated pollutants of concern, anticipated pollutants of concern in downstream receiving waters, and conditions of concern, must also be included in the WQTR as part of the project submittal.

All new development and significant redevelopment projects that fall into one of the following "Priority Development Project" categories, and have not obtained their Grading, Construction, or Building Permit by March 24, 2008, are subject to the SUSMP requirements included in this Development Storm Water Manual. In the instance where a project feature, such as a parking lot, falls into a priority project category, the entire project footprint is subject to these SUSMP requirements. These categories are:

- Residential development of 10 units or more
- Commercial development greater than 1 acre
- Heavy Industry
- Industrial development greater than 1 acre
- Automotive repair shops
- Restaurants
- Hillside development greater than 5,000 square feet
- Projects located within or directly adjacent to or directly discharging to receiving waters within Environmentally Sensitive Areas that create 2,500 square feet or

more of impervious surface or increase the area of imperviousness to 10% or more of its naturally occurring condition

- Projects greater than 2,500 square feet of impervious surface that discharge to receiving waters within or adjacent to Environmentally Sensitive Areas
- Parking Lots 5,000 square feet or more impervious surface or with >15 parking spaces and potentially exposed to urban runoff
- Streets, roads, highways, and freeways which would create a new paved surface that is 5,000 square feet or greater of impervious surface
- Retail gasoline outlets 5,000 square feet or more or with a projected Average daily Traffic (ADT) of 100 or more vehicles per day.

Limited Exclusion: Trenching and resurfacing work associated with utility projects; resurfacing and reconfiguring surface parking lots and existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair are not considered priority projects. Parking lots, buildings and other structures associated with utility projects are subject to SUSMP requirements if one or more of the criteria for the above categories are met.

III. Definitions

For the definition of terms used in this section, please refer to Section 9 of this Manual.

IV. Conflict with Local Practices or Municipal Permit

Where requirements of this SUSMP conflict with established local codes, (e.g., specific language of signage used on storm drain stenciling), the City of Chula Vista may continue the local practice and modify the SUSMP to be consistent with the code, except that to the extent that the standards in the SUSMP are more stringent than those under local codes, then such more stringent standards shall apply.

V. Implementation Process

The departments responsible for ensuring SUSMP requirements are implemented and the roles and responsibilities of each department are identified in the City's Jurisdictional Urban Runoff Management Program (JURMP). Project proponents are required to identify SUSMP requirements for their projects by consideration of project review and permitting process described in Section 2 of this Manual and to incorporate appropriate BMPs into the project design. SUSMP requirements should be identified and incorporated in the project design at the earliest possible stage of the project development and review process. However, at a minimum, for discretionary projects, SUSMP requirements shall be incorporated into the project design and shown on the plans prior to decision-maker approval of discretionary permits.

For projects requiring only ministerial permits, SUSMP requirements shall be incorporated into the project design and shown on the plans prior to the issuance of any

ministerial permits. City departments carrying out public projects that are not required to obtain permits shall be responsible for ensuring SUSMP requirements are incorporated into the project design and shown on the plans prior to bidding for construction contracts, or equivalent. For public projects SUSMP requirements must be incorporated into the project design and shown on the plans before allowing the project to commence.

VI. Storm Water BMP Selection Procedure

This section provides a procedure for identifying a project's pollutants and conditions of concern, and addressing these through site design, source control, and treatment control storm water BMPs. All priority projects shall implement one or a combination of storm water BMPs, including, 1) LID and site design BMPs, 2) source control BMPs and, 3) structural treatment BMPs after the pollutants and conditions of concern have been identified. Storm water BMPs, from those listed in Section 3.VII.1: "Storm Water Best Management Practices" shall be considered and implemented where expressly required by the Municipal Permit or, where determined applicable and feasible by the City of Chula Vista. Additional information on BMPs is included in the notes to Table 3.3 and in the references in Section 3.VII.2. The storm water BMPs shall adhere to the requirements in this section and shall be correctly designed so as to remove pollutants to the MEP. A flow chart summarizing the storm water BMP selection procedure is provided in Figure 3.1.

Site Design Storm Water Treatment Credits

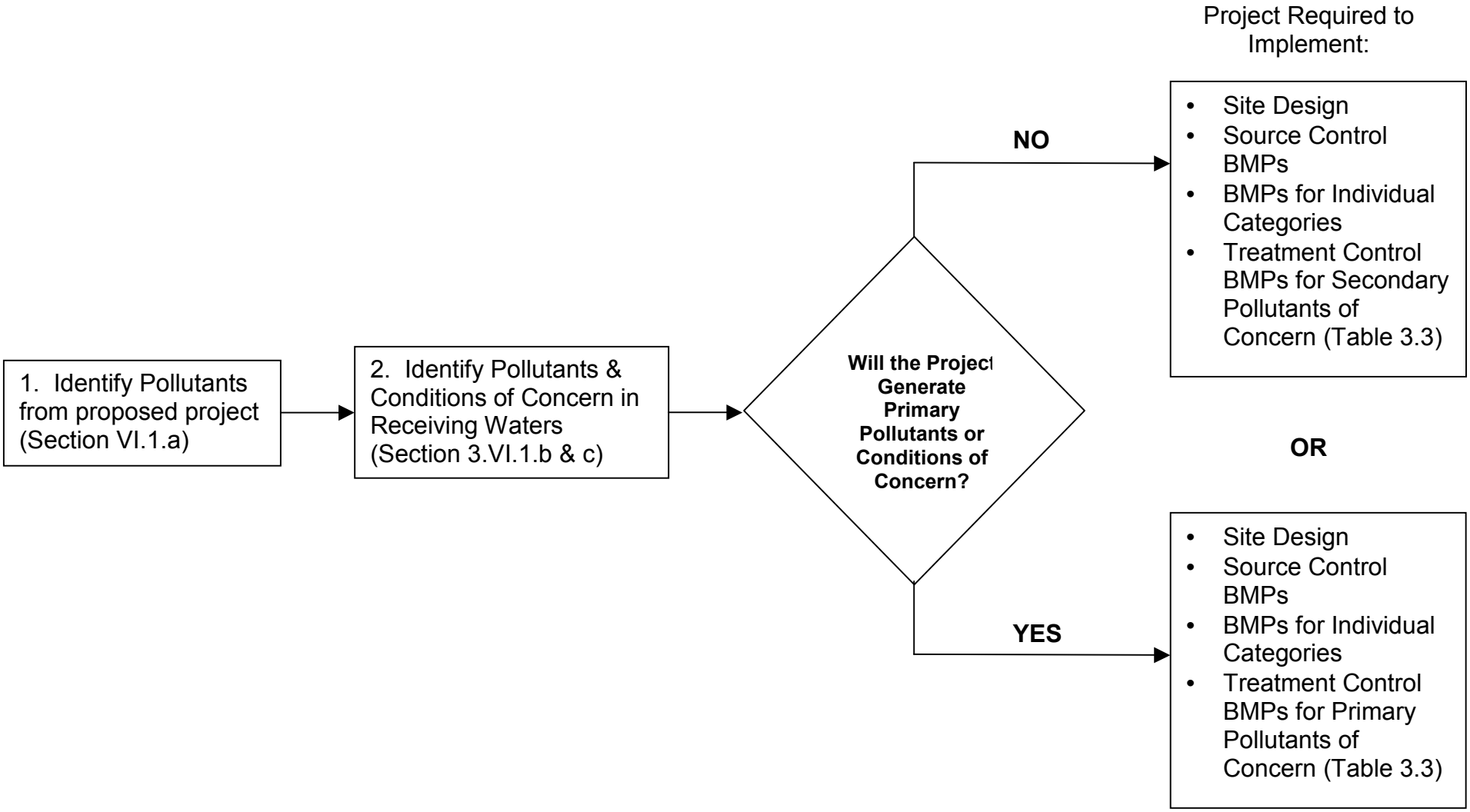
The Copermittees may develop and submit for public review and comment, and Regional Board approval, a regional Model Site Design Storm Water Treatment Credits program that allows reductions in the volume or flow of storm water that must be captured or treated on a project in return for the inclusion of specified project design features in the project. The Model Site Design Storm Water Treatment Credits program shall be deemed to be a part of this SUSMP following Regional Board approval. Any such model program shall specify the conditions under which project proponents can be credited for the use of site design features and Low Impact Development techniques that can reduce the volume of storm water runoff, preserve natural areas, and minimize the pollutant loads generated and potentially discharged from the site. Any Site Design Storm Water Treatment Credits program implemented by the City of Chula Vista within its jurisdiction shall be consistent and compliant with the model approved by the Regional Board.

Alternative Methods for Achieving Treatment Requirements

The City of Chula Vista may implement the Localized Equivalent Area Drainage (LEAD) Method, as proposed by the City of San Diego in its May 16, 2002 letter (Section 3.VII.3) for meeting the BMP requirements in Section 3.VI.2.c, Step 8, "Design to Treatment Control BMP Standards," for inclusion in this SUSMP. The alternative method must, at a minimum, meet the following criteria:

1. The alternative treatment area shall be located within the proximity of the project;
2. The alternative treatment area shall discharge to the same receiving water as the project;
3. The alternative treatment area shall be equivalent to or greater than, the project footprint;
4. The alternative treatment area shall have an equivalent or greater impervious surface area than the project;
5. The alternative treatment area shall have an equivalent or greater pollutant load than the project;
6. Site Design and Source Control BMPs (Section 3.VI.2.a & b) shall be required in the project design; and,
7. Alternative treatments shall be limited to redevelopment and/or infill projects.

Figure 3.1. Storm Water BMP Selection Procedure Flow Chart



1. Identify Pollutants & Conditions of Concern

Priority project proponents shall use this guidance to identify pollutants and conditions of concern for which they need to mitigate or protect against. Once identified, appropriate control measures for these pollutants and conditions are specified in Section 3.VI.2, "Establish Storm Water BMPs." Site design and source control BMPs are required based on pollutants commonly associated with the proposed project type (see Table 3.2, "Site Design and Source Control Storm Water BMP Selection Matrix"). Treatment Control BMPs are also required for the project's expected pollutants of concern (see Table 3.3).

For private priority projects, the City shall require the information to be provided with the project application prior to being deemed complete. For public priority projects, the City shall approve the information prior to bidding for construction contracts.

General Categories of Water Pollution

Urban runoff from a developed site has the potential to contribute pollutants, including oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the storm water conveyance system and receiving waters. For the purposes of identifying pollutants of concern and associated storm water BMPs, pollutants are grouped in nine general categories as follows:

1. Sediments – Sediments are soils or other surficial materials eroded and then transported or deposited by the action of wind, water, ice, or gravity. Sediments can increase turbidity, clog fish gills, reduce spawning habitat, lower young aquatic organisms survival rates, smother bottom dwelling organisms, and suppress aquatic vegetation growth.
2. Nutrients – Nutrients are inorganic substances, such as nitrogen and phosphorus. They commonly exist in the form of mineral salts that are either dissolved or suspended in water. Primary sources of nutrients in urban runoff are fertilizers and eroded soils. Excessive discharge of nutrients to water bodies and streams can cause excessive aquatic algae and plant growth. Such excessive production, referred to as cultural eutrophication, may lead to excessive decay of organic matter in the water body, loss of oxygen in the water, release of toxins in sediment, and the eventual death of aquatic organisms.
3. Metals – Metals are raw material components in non-metal products such as fuels, adhesives, paints, and other coatings. Primary sources of metal pollution in storm water are typically commercially available metals and metal products. Metals of concern include cadmium, chromium, copper, lead, mercury, and zinc. Lead and chromium have been used as corrosion inhibitors in primer coatings and cooling tower systems. At low concentrations naturally occurring in soil, metals are not toxic. However, at higher concentrations, certain metals can be toxic to aquatic life. Humans can be impacted from contaminated groundwater resources, and bioaccumulation of metals in fish and shellfish. Environmental

concerns, regarding the potential for release of metals to the environment, have already led to restricted metal usage in certain applications.

4. Organic Compounds – Organic compounds are carbon-based. Commercially available or naturally occurring organic compounds are found in pesticides, solvents, and hydrocarbons. Organic compounds can, at certain concentrations, indirectly or directly constitute a hazard to life or health. When rinsing off objects, toxic levels of solvents and cleaning compounds can be discharged to storm drains. Dirt, grease, and grime retained in the cleaning fluid or rinse water may also adsorb levels of organic compounds that are harmful or hazardous to aquatic life.
5. Trash & Debris – Trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic matter (such as leaves, grass cuttings, and food waste) are general waste products on the landscape. The presence of trash & debris may have a significant impact on the recreational value of a water body and aquatic habitat. Excess organic matter can create a high biochemical oxygen demand in a stream and thereby lower its water quality. Also, in areas where stagnant water exists, the presence of excess organic matter can promote septic conditions resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds such as hydrogen sulfide.
6. Oxygen-Demanding Substances – This category includes biodegradable organic material as well as chemicals that react with dissolved oxygen in water to form other compounds. Proteins, carbohydrates, and fats are examples of biodegradable organic compounds. Compounds such as ammonia and hydrogen sulfide are examples of oxygen-demanding compounds. The oxygen demand of a substance can lead to depletion of dissolved oxygen in a water body and possibly the development of septic conditions.
7. Oil and Grease – Oil and grease are characterized as high-molecular weight organic compounds. Primary sources of oil and grease are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high molecular-weight fatty acids. Introduction of these pollutants to the water bodies are very possible due to the wide uses and applications of some of these products in municipal, residential, commercial, industrial, and construction areas. Elevated oil and grease content can decrease the aesthetic value of the water body, as well as the water quality.
8. Bacteria and Viruses – Bacteria and viruses are ubiquitous microorganisms that thrive under certain environmental conditions. Their proliferation is typically caused by the transport of animal or human fecal wastes from the watershed. Water, containing excessive bacteria and viruses can alter the aquatic habitat and create a harmful environment for humans and aquatic life. Also, the decomposition of excess organic waste causes increased growth of undesirable organisms in the water.

9. Pesticides – Pesticides (including herbicides) are chemical compounds commonly used to control nuisance growth or prevalence of organisms. Excessive application of a pesticide may result in runoff containing toxic levels of its active component.

a. Identify Pollutants from the Project Area

Using Table 3.1, identify pollutants that are anticipated to be generated from the proposed priority project categories. Pollutants associated with any hazardous material sites that have been remediated or are not threatened by the proposed project are not considered a pollutant of concern.

Table 3.1. Anticipated and Potential Pollutants Generated by Land Use Type.

	General Pollutant Categories								
Priority Project Categories	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P(1)	P(2)	P	X
Commercial Development > One Acre	P(1)	P(1)		P(2)	X	P(5)	X	P(3)	P(5)
Heavy industry /industrial development	X		X	X	X	X	X		
Automotive Repair Shops			X	X(4)(5)	X		X		
Restaurants					X	X	X	X	
Hillside Development >5,000 ft^2	X	X			X	X	X		X
Parking Lots	P(1)	P(1)	X		X	P(1)	X		P(1)
Retail Gasoline Outlets			X	X	X	X	X		
Streets, Highways & Freeways	X	P(1)	X	X(4)	X	P(5)	X		

X = anticipated
P = potential
(1) A potential pollutant if landscaping exists on-site.
(2) A potential pollutant if the project includes uncovered parking areas.
(3) A potential pollutant if land use involves food or animal waste products.
(4) Including petroleum hydrocarbons.
(5) Including solvents.

b. Identify Pollutants of Concern

Pollutants generated by the proposed Priority Development Project that exhibit one or more of the following characteristics are considered primary pollutants of concern:

1. Current loadings or historical deposits of the pollutant are impairing the beneficial uses of a receiving water;
2. Elevated levels of the pollutant are found in water or sediments of a receiving water and/or have the potential to be toxic to or bio-accumulate in organisms therein; and,
3. Inputs of the pollutant are at a level high enough to be considered potentially toxic.

To identify primary pollutants of concern in receiving waters, each priority project shall, at a minimum, do the following:

1. For each of the proposed project's discharge points, identify the receiving water(s) that each discharge point proposes to discharge to, including hydrologic unit basin number(s), as identified in the most recent version of the *Water Quality Control Plan for the San Diego Basin*[1], prepared by the San Diego Regional Water Quality Control Board.
2. Identify any receiving waters, into which the developed area would discharge to, listed on the most recent list of Clean Water Act Section 303(d) impaired water bodies[2]. List any and all pollutants for which the receiving waters are impaired.
3. Compare the list of pollutants for which the receiving waters are impaired with the pollutants anticipated to be generated by the project (as identified in Table 3.1). Any pollutants identified from Table 3.1 that are also causing impairment of receiving waters shall be considered primary pollutants of concern.

For projects where no primary pollutants of concern exist, those pollutants identified through the use of Table 3.1 shall be considered secondary pollutants of concern.

c. Identify Conditions of Concern

Common impacts to the hydrologic regime resulting from development typically include increased runoff volume and velocity; reduced infiltration; increased flow frequency, duration, and peaks; faster time to reach peak flow; and, water quality degradation. These changes have the potential to permanently impact downstream channels and habitat integrity. A change to a priority project site's hydrologic regime would be considered a Condition of Concern if the change would impact downstream channels and habitat integrity.

[1] http://www.waterboards.ca.gov/sandiego/programs/basinplan.html
[2] http://www.swrcb.ca.gov/tmdl/docs/303dlists2006/approved/r9_06_303d_reqtmdls.pdf

Because of these potential impacts, the City of Chula Vista requires the following steps to be followed for Priority Development Projects, unless the City determines that the project would not result in impact to the hydrologic regime:

1. Evaluate the project's Conditions of Concern in a drainage study report prepared by a Registered Civil Engineer in the State of California, with experience in fluvial geomorphology and water resources management. The report shall consider the project area's location (from the larger watershed perspective), topography, soil and vegetation conditions, percent impervious area, natural and infrastructure drainage features, wet season groundwater depth, and any other relevant hydrologic and environmental factors to be protected specific to the project area's watershed.
2. As part of the drainage study, a qualified, licensed professional shall provide a report on proposed infiltration techniques (trenches, basins, dry wells, permeable pavements with underground reservoir for infiltration) regarding any potential adverse geotechnical concerns. Geotechnical conditions, such as slope stability, expansive soils, compressible soils, seepage, groundwater depth, and loss of foundation or pavement subgrade strength should be addressed, and mitigation measures provided.
3. As part of the drainage study, the Civil Engineer shall conduct a field reconnaissance to observe and report on downstream conditions, including undercutting erosion, slope stability, vegetative stress (due to flooding, erosion, water quality degradation, or loss of water supplies), and the area's susceptibility to erosion or habitat alteration as a result of an altered flow regime.
4. The drainage study shall compute rainfall runoff characteristics from the project area including, at a minimum, peak flow rate, flow velocity, runoff volume, time of concentration, and retention volume. These characteristics shall be developed for the two-year and 10-year frequency, Type I storm, of six-hour or 24-hour duration (whichever is the closer approximation of the site's time of concentration), during critical hydrologic conditions for soil and vegetative cover[3]. The drainage study shall report the project's Conditions of Concern based on the hydrologic and downstream conditions discussed above. Where downstream conditions of concern have been identified, the drainage study shall establish that pre-project hydrologic conditions affecting downstream Conditions of Concern would be maintained by the proposed project, satisfactory to the City, by incorporating the Site Design, Low Impact Development, Source Control, and Treatment Control requirements identified in Section 3.VI.2.

[3]. Design storms can be found at http://www.wrcc.dri.edu/pcpnfreq.html. In addition, isopluvial maps contained in the County of San Diego Hydrology Manual may be used to extrapolate rainfall data to areas where insufficient data exists. If isopluvial maps are selected, the drainage study shall describe the methodology for using the isopluvial maps.

For Priority Development Projects that disturb 50 acres or more:

1. Priority Development Project post-project runoff flow rates and durations shall not exceed pre-project runoff flow rates and durations (Interim Hydromodification Criteria), where the increased discharge flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to changes in flow rates and durations.

2. Priority Development Projects disturbing 50 acres or more shall implement hydrologic controls to manage post-project runoff flow rates and durations as required by the Interim Hydromodification Criteria as follows:

Interim Hydromodification Criteria

Priority Development Projects disturbing 50 acres or more are required to comply with the following Interim Hydromodification Criteria (IHC) requirements. The interim criteria will apply until the Final Hydrograph Modification Management Plan (HMP) is implemented. The purpose of the IHC is to prevent development-related changes in storm water runoff from causing, or further accelerating, stream channel erosion or other adverse impacts to beneficial stream uses. This goal is achieved by limiting Priority Development Project post-project runoff flow rates and durations to pre-project runoff flow rates and durations for a range of runoff flow rates. Two compliance options are provided – curve-matching based on continuous simulations modeling, and implementation of Low Impact Development Integrated Management Practices (LID IMPs).

The range of flows to be managed is expressed as a percentage of the 5-year peak flow (Q5) based on the understanding that dominant discharge from Southern California streams is in the vicinity of Q5. The following IHC shall be used:

1. Estimated post-project runoff durations and peak flows shall not exceed pre-project durations and peak flows as described below. The project proponent must use a continuous simulation hydrologic computer model such as USEPA' Hydrograph Simulations Program – Fortran (HSPF) to simulate pre-project and post-project runoff, including the effect of proposed LID IMPs, detention basins, or other storm water management facilities. To use this method, the project proponent shall compare the pre-project and post-project model output for a rainfall record of at least 30 years, and shall show the following criteria are met:

    a. For flow rates from 20% of the pre-project 5-year runoff event (0.2Q5) to the pre-project 10-year runoff event (Q10), the post-project discharge rates and durations shall not deviate above the pre-project rates and durations by more than 10% over more than 10% of the length of the flow duration curve. *(Note that the 0.2Q5 end of the range may be modified)*.

b. For flow rates from 0.2Q5 to Q5, the post-project peak flows shall not exceed pre-project peak flows. For flow rates from Q5 to Q10, post-project peak flows may exceed pre-project flows by up to 10% for a 1-year frequency interval. For example, post-project flows could exceed pre-project flows by up to 10% for the interval from Q9 to Q10 or from Q5.5 to Q6.5, but not from Q8 to Q10. *(Note that the 0.2Q5 end of the range may be modified)*.

2. Implementation of Low Impact Development Integrated Management Practices (LID IMPs). The project proponent may implement LID IMPs to manage hydrograph modification impacts, using design procedures, criteria, and sizing factors (ratios of LID IMP volume or area to tributary area) satisfactory to the City.

Development projects disturbing 50 acres or more are exempt from this requirement when:

a. The project would discharge into channels that are concrete-lined or significantly hardened (e.g., with rip-rap, sackcrete, etc.) downstream to their outfall in bays or the ocean;

b. The project would discharge into underground storm drains discharging directly to bays or the ocean; or

c. The project would discharge to a channel where the watershed areas below the project's discharge points are highly impervious (e.g.> 70%).

A summary of discussions and calculations regarding Conditions of Concern and Interim Hydromodification Criteria from the hydrology study shall be included in the Water Quality Technical Report submitted for the Priority Development Project.

It is anticipated that early in 2010, the Interim Hydromodification Criteria requirements will be replaced by the Final Hydrograph Modification Management Plan (HMP), in which case the new requirements will be applicable to development and redevelopment projects from the effective date of the Final HMP.

2. Establish Storm Water BMPs

Site Design BMPs may reduce the need for Source and/or Treatment Control BMPs, and Source Control BMPs may reduce the amount of Treatment Control BMPs needed. Where required by the Municipal Permit and determined applicable and feasible by the City of Chula Vista, all priority projects shall consider, incorporate, and implement storm water BMPs in the following progression:

- Site Design BMPs
- Source Control BMPs

- Treatment Control BMPs

Priority projects must implement LID Site Design BMPs and Source Control BMPs, and must also implement Treatment Control BMPs unless a waiver is granted based on the infeasibility of all Treatment Control BMPs. LID BMPs must meet minimum requirements in Permit section D.1.d.(4). BMPs must also achieve certain performance standards in Permit section D.1.d.(5) and (6). Selection of BMPs from the menus included in this SUSMP using the rules set out in this SUSMP must fulfill these requirements.

In addition, runoff treated by LID and Site Design or Source Control BMPs, such as rooftop runoff treated in landscaping, may be useful in reducing the quantity of runoff required to be treated in Section 3.VI.2.c, "Treatment Control BMPs."

To select a structural treatment BMP using the Treatment Control BMP Selection Matrix, each Priority Development Project shall compare the list of pollutants for which the downstream receiving waters are impaired (if any) with the pollutants anticipated to be generated by the project (as identified in Table 3.1). Any pollutants identified by Table 3.1, which are also causing a Clean Water Act section 303(d) impairment of the receiving waters of the project, shall be considered Primary Pollutants of Concern. Priority Development Projects that are anticipated to generate a Primary Pollutant of Concern shall meet all applicable BMP requirements identified in Section 3.VI.2, and shall select a single or combination of storm water BMPs from Table 3.3, which maximizes pollutant removal for the particular Primary Pollutant(s) of Concern.

Alternatively, a project proponent may elect to implement a combination of LID BMPs that either disperse and infiltrate, or direct to bioretention facilities, the flows from all impervious areas on-site. These BMPs are presumed to provide Maximum Extent Practicable treatment for all Pollutants of Concern; therefore, no further documentation of the treatment BMP selection process is required.

Priority Development Projects that are <u>not</u> anticipated to generate a pollutant for which the receiving water is Clean Water Act Section 303(d) impaired shall meet applicable standard requirements in Section 3.VI.2, and shall select a single or combination of storm water BMPs from Table 3.3 that are effective for pollutant removal of the identified Secondary Pollutants of Concern, consistent with the "Maximum Extent Practicable" standard defined in Section 9 of this Manual.

Where a site generates both Primary and Secondary Pollutants of Concern, Primary Pollutants of Concern receive priority for BMP selection. For such sites, selected BMPs must only maximize pollutant removal for the Primary Pollutants of Concern. Where a site generates only Secondary Pollutants of Concern, selected BMPs shall target the Secondary Pollutant of Concern determined to be most significant for the project. Selected BMPs must be effective for the widest range of Pollutants of Concern anticipated to be generated by a Priority Development Project (as identified in Table 3.1), consistent with the Maximum Extent Practicable standard.

Treatment Control BMPs with a high or medium pollutant removal efficiency for the project's most significant Pollutant of Concern shall be selected. Treatment Control BMPs with a low removal efficiency ranking will only be approved by the City of Chula Vista when a feasibility analysis has been conducted which exhibits that implementation of Treatment Control BMPs with a high or medium removal efficiency ranking are infeasible. Treatment Control BMPs shall not be constructed within Receiving Waters. Alternative storm water BMPs not identified in Table 3.3 may be approved at the discretion of the City of Chula Vista, provided the alternative BMP is as effective in removal of pollutants of concern as other feasible BMPs listed in Table 3.3.

Table 3.2: Site Design and Source Control Storm Water BMP Selection Matrix.

Priority Project Category	*Site Design BMPs[1]*	*Source Control BMPs[2]*	*Requirements Applicable to Individual Priority Project Categories[3]*										
			a. Private Roads	b. Residential Driveways & Guest Parking	c. Dock Areas	d. Maintenance Bays	e. Vehicle Wash Areas	f. Outdoor Processing Areas	g. Equipment Wash Areas	h. Parking Areas	i. Roadways	j. Fueling Areas	k. Hillside Landscaping
Detached Residential Development	R	R	R	R									R
Attached Residential Development	R	R	R										
Commercial Development > One Acre	R	R			R	R	R	R					
Automotive Repair Shop	R	R			R	R	R		R			R	
Restaurants	R	R			R				R				
Hillside Development >5,000 ft^2	R	R	R										R
Parking Lots	R	R								R[4]			
Streets, Highways & Freeways	R	R									R		

R = Required; select BMPs as required from the applicable steps in Section 3.VI.2.a & b, or equivalent as identified in Section 3.VII.1.
(1) Refer to Section 3.VI.2.a.
(2) Refer to Section 3.VI.2.b.
(3) Priority project categories must apply specific storm water BMP requirements, where applicable. Projects are subject to the requirements of all priority project categories that apply.
(4) Applies if the paved area totals >5,000 square feet or with >15 parking spaces and is potentially exposed to urban runoff.

Table 3.3: Treatment Control BMP Selection Matrix

Pollutants of Concern	*Bioretention Facilities (LID)*	*Settling Basins (Dry Ponds)*	*Wet Ponds and Wetlands*	*Infiltration Facilities or Practices (LID)*	*Media Filters*	*High-rate biofilters*	*High-rate media filters*	*Trash Racks & Hydro -dynamic Devices*
Coarse Sediment and Trash	High	High	High	High	High	High	High	High
Pollutants that tend to associate with fine particles during treatment	High	High	High	High	High	Medium	Medium	Low
Pollutants that tend to be dissolved following treatment	Medium	Low	Medium	High	Low	Low	Low	Low

Notes on Treatment Control BMP Categories:

All rankings are relative. Ranking of all facilities assumes proper sizing, design, and periodic maintenance. Following are general descriptions of each category:

1. **Bioretention Facilities** (infiltration planters, flow-through planters, bioretention areas, and bioretention swales). Facilities are designed to capture runoff and infiltrate slowly through soil media, which also supports vegetation. Bioretention facilities, except for flow-through planters, effectively promote infiltration into native soils. In low-permeability soils such as clay soils, facilities may capture excess treated runoff in an underdrain piped to the municipal storm drain system. Typical criteria: an infiltration surface area at least 4% of tributary impervious area, 6-inch average depth of top reservoir, 18-inch soil layer, 12-inch to 18-inch gravel subsurface storage layer.

2. **Settling Basins and Wetlands** (extended detention basins, "wet" basins, decorative or recreational lakes or water features also used for storm water treatment, constructed wetlands). Facilities are required to be designed to capture the 85th percentile storm event and detain for a minimum of 48 hours. Some wetland designs have proven effective in removing nutrients, but performance varies.

3. **Infiltration Facilities or Practices** (infiltration basins, infiltration trenches, dry wells, dispersal of runoff to landscape, pervious pavements). These facilities and landscape elements should be designed to capture, retain, and infiltrate the flow or volume of runoff that would enter the facility or landscape feature from the 85th percentile storm event. Infiltration facilities are generally only feasible in permeable (Hydrologic Soil Group A or B) soils. Volume and area of infiltration facilities depends on soil permeability and safety factor used. Typical criteria: Infiltration facilities shall have pretreatment to remove silt to prolong life of the facility. A 10-foot vertical separation from average seasonal groundwater depth is required. Dispersal to landscape may be accomplished in any soil type and generally requires a maximum 2:1 ratio impervious: pervious and concave topography to ensure the first 1-inch of rainfall is retained.

4. **Media Filters** (sand filters). Filters designed to treat runoff produced by a rainfall of 0.2 inches per hour (or 2 × 85th percentile hourly rainfall intensity) by slow infiltration through sand or other media. Typical criteria: Surface-loading rate not to exceed 5 inches/hour. Entire surface of the sand must be accessible for maintenance.

5. **High Rate Biofilters** (tree wells, typically proprietary). Biofilters with specially designed media to rapidly filter runoff while removing some pollutants. Some proprietary High Rate Biofilters recommend surface loading rates of up to 100 inches/hour.

6. **High-rate Media Filters** (typically proprietary). Vaults with replaceable cartridge filters filled with inorganic media.

7. **Drainage Inserts** currently available have low effectiveness in removing pollutants that tend to associate with fine particles and have medium effectiveness in removing coarse sediment and trash. The Permit requires the removal of obsolete or ineffective BMPs from the list of acceptable BMPs. The City of Chula Vista has removed Drainage Inserts from Table 3.3, Treatment Control BMP Selection Matrix. Drainage Inserts may only be used in exceptional cases to augment more effective treatment facilities or sometimes used alone when more effective facilities have been deemed infeasible at the City's discretion.

Notes on Pollutants of Concern:

In Table 3.3, Pollutants of Concern are grouped as coarse sediment and trash, pollutants that tend to associate with fine particles, and pollutants that remain dissolved.

Pollutant	*Coarse Sediment and Trash*	*Pollutants that tend to associate with fine particles during treatment*	*Pollutants that tend to be dissolved following treatment*
Sediment	X	X	
Nutrients		X	X
Heavy Metals		X	
Organic Compounds		X	
Trash & Debris	X		
Oxygen Demanding		X	
Bacteria		X	
Oil & Grease		X	
Pesticides		X	

a. Low Impact Development (LID) and Site Design BMPs

Priority Development Projects shall be designed so as to minimize directly connected impervious surfaces and to promote infiltration using LID techniques. Priority Development Projects shall, to the Maximum Extent Practicable, minimize the introduction of Pollutants and Conditions of Concern that may result in significant impacts, generated from site runoff to the storm water conveyance system. Priority Development Projects shall also control post-development peak storm water runoff discharge rates and velocities to maintain or reduce pre-development downstream erosion and to protect stream habitat. Priority Development Projects can address these objectives through the creation of a hydrologically functional project design that attempts to mimic the natural hydrologic regime. Many of these techniques are outlined and reviewed in the County of San Diego's LID Handbook and Appendices. Mimicking a site's natural hydrologic regime can be pursued by:

1. Reducing imperviousness, conserving natural resources and areas, maintaining and using natural drainage courses in the storm water conveyance system, and minimizing clearing and grading.

2. Providing runoff storage measures dispersed throughout a site's landscape with the use of bioretention facilities and detention, retention, and infiltration practices.

These design principles offer an innovative approach to urban storm water management, one that does not rely on the conventional end-of-pipe or in-the-pipe structural methods but instead uniformly or strategically integrates storm water controls throughout the urban landscape. Useful resources for applying these principles, referenced in Section 3.VII.2, include the County of San Diego's LID Handbook (2007), Start at the Source (1999), Low-Impact Development Design Strategies (1999), the City of Portland's Storm Water Manual (2004), and the Contra Costa Clean Water Program's Storm Water C.3 Guidebook (2006).

Step 1: Objective: Control Runoff to Minimize Downstream Erosion

Priority Development Projects shall control post-development peak storm water runoff discharge rates and velocities to maintain or reduce pre-development downstream erosion. In addition, projects should control runoff discharge volumes and durations to the Maximum Extent Practicable using the Site Design, Source Control, LID, and Treatment Control requirements identified in Section 3.VI.2.

Design Concept 1: Minimize Project's Impervious Footprint & Conserve Natural Areas

The following site design options shall be considered and, incorporated and implemented where determined applicable and feasible by the City of Chula Vista, during the site planning and approval process, consistent with applicable General Plan policies and other development regulations.

1. Minimize and disconnect impervious surfaces. This can be achieved in various ways, including, but not limited to increasing building density (number of stories above or below ground) and developing land use regulations seeking to limit impervious surfaces. Decreasing the project's footprint can substantially reduce the project's impacts to water quality and hydrologic conditions.

2. Conserve natural areas, soils, and vegetation where feasible. This can be achieved by concentrating or clustering development on the least environmentally sensitive portions of a site while leaving the remaining land in a natural, undisturbed condition. The following list provides a guideline for determining the least sensitive portions of the site, in order of increasing sensitivity. Applicants should also refer to the City's Multiple Species Conservation Plans or other biological regulations, as appropriate.

    - Areas devoid of vegetation, including previously graded areas and agricultural fields.
    - Areas of non-native vegetation, disturbed habitats and eucalyptus woodlands.

- Areas of chamise or mixed chaparral, and non-native grasslands.
- Areas containing coastal scrub communities.
- All other upland communities.
- Occupied habitat of sensitive species and all wetlands (as both are defined by the City of Chula Vista).
- All areas necessary to maintain the viability of wildlife corridors.

Within each of the previous categories, areas containing hillsides (as defined in this Manual) should be considered more sensitive than the same category without hillsides.

3. Construct walkways, trails, patios, overflow parking lots and alleys and other low-traffic areas with permeable surfaces, such as pervious concrete, permeable asphalt, unit pavers, and granular materials.
4. Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and a walkable environment for pedestrians are not compromised.
5. Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.
6. Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.
7. Use natural drainage systems to the maximum extent practicable.
8. Other site design options, which are comparable, and equally effective.
9. Minimize soil compaction.

Design Concept 2: Minimize Directly Connected Impervious Areas (DCIAs)

Priority Development Projects shall consider, incorporate, and implement the following design characteristics, where determined applicable and feasible by the City of Chula Vista.

1. Where landscaping is proposed, drain rooftops into adjacent landscaping prior to discharging to the storm drain.
2. Where landscaping is proposed, drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping.
3. Other design characteristics, which are comparable and equally effective.

Step 2: Protect Slopes and Channels

Project plans shall include storm water BMPs to decrease the potential for erosion of slopes and/or channels, consistent with local codes and ordinances and with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers, the San Diego Regional Water Quality Control Board, and the California Department of Fish and Game. The following design principles shall be considered, incorporated, and implemented where determined applicable and feasible by the City of Chula Vista:

1. Minimize disturbances to Natural Drainages.
2. Convey runoff safely from the tops of slopes.
3. Vegetate slopes with native or drought tolerant vegetation.
4. Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
5. Stabilize permanent channel crossings.
6. Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
7. Employ other design principles, which are comparable and equally effective as determined by the City Engineer.

b. Source Control BMPs

Step 3: Provide Storm Drain System Stenciling and Signage

Storm drain stencils are highly visible source control messages, typically placed directly adjacent to storm drain inlets. The stencils contain a brief statement that prohibits the dumping of improper materials into the urban runoff conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message. Priority Development Projects shall include the following requirements in the project design.

1. Provide stenciling or labeling of all storm drain inlets and catch basins within the project area with prohibitive language (such as: “NO DUMPING – I LIVE DOWNSTREAM”) and/or graphical icons to discourage illegal dumping.
2. Post signs and prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.
3. Maintain legibility of stencils and signs.

Storm drain stenciling and signage within public right-of-way shall be in accordance with Chula Vista Construction Standard CVCS 24 (please see Section 6 of this Manual).

Step 4: Design Outdoor Material Storage Areas to Reduce Pollution Introduction

Improper storage of materials outdoors may increase the potential for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the urban runoff conveyance system. Where the Priority Development Project plans include outdoor areas for storage of hazardous materials that may contribute pollutants to the urban runoff conveyance system, the following storm water BMPs are required:

1. Hazardous materials with the potential to contaminate urban runoff shall either be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or

similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.
2. Storage areas shall be paved and sufficiently impervious to contain leaks and spills.
3. Storage areas shall have a roof or awning to minimize direct precipitation within the secondary containment area.

Step 5: Design Trash Storage Areas to Reduce Pollution Introduction

All trash container areas shall meet the following requirements (limited exclusion: detached residential homes):

1. Paved with an impervious surface, designed to not allow run-on from adjoining areas, screened or walled to prevent off-site transport of trash; and
2. Covered with a roof or awning to minimize direct precipitation.
3. Designed in accordance with Chula Vista Municipal Code Section 19.58.340.

Step 6: Use Efficient Irrigation Systems & Landscape Design

Priority Development Projects shall design the timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water conveyance system. (Limited exclusion: detached residential homes.) In compliance with the Water Conservation in Landscaping Act, the following methods to reduce excessive irrigation runoff shall be considered, and incorporated and implemented where determined applicable and feasible by the City of Chula Vista:

1. Employ rain shutoff devices to prevent irrigation after precipitation.
2. Design irrigation systems to each landscape area's specific water requirements.
3. Use flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
4. Employ other comparable, equally effective methods to reduce irrigation water runoff, as determined by the City Engineer.

Step 7: Incorporate Requirements Applicable to Individual Priority Project Categories

Where identified in Table 3.2, the following requirements shall be incorporated into applicable Priority Development Projects during the storm water BMP selection and design process. Projects shall adhere to each of the individual Priority Development Project category requirements that apply to the project (e.g., a restaurant with more than 15 parking spaces would be required to incorporate the requirements for "g. Equipment Wash Areas" and "h. Parking Areas" into the project design).

a. Private Roads

Private roadway drainage shall use at least one of the following (for further guidance, see *Start at the Source* [1999]):

1. Rural swale system: Design street runoff to sheet flow to vegetated swales or gravel shoulders.
2. Urban curb/swale system: Provide periodic curb cuts to allow street runoff to drain to vegetated swale/biofilter;
3. Dual drainage system: Capture first flush in street catch basins and discharge to adjacent vegetated swale or gravel shoulder. Connect high flows directly to storm water conveyance system.
4. Other methods, which are comparable and equally effective within the project, as determined by the City Engineer.

b. Residential Driveways & Guest Parking

Driveways and private residential parking areas shall use at least one of the following features:

1. Design driveways:
   a. With shared access;
   b. Flared (single lane at street);
   c. Paved only under tires; or,
   d. To drain into landscaping
2. Pave uncovered parking on private residential lots with a permeable surface, or design parking to drain into landscaping.
3. Other features which are comparable and equally effective, as determined by the City Engineer.

c. Dock Areas

Loading/unloading dock areas shall include the following:

1. Cover loading dock areas or design drainage to preclude urban run-on and runoff.
2. Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.
3. Other features which are comparable and equally effective, as determined by the City Engineer.

d. Maintenance Bays

Maintenance Bays shall include the following:

1. Repair/maintenance bays shall be indoors or designed to preclude urban run-on and runoff; and,
2. Repair/maintenance bay drainage systems shall be designed to capture all wash water, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local sewer agency, obtain an Industrial Waste Discharge Permit.

OR

3. Other features which are comparable and equally effective, as determined by the City Engineer.

e. Vehicle Wash Areas

Priority projects that include areas for washing/steam cleaning of vehicles shall be:

1. Self-contained; or covered with a roof or overhang;
2. Equipped with a clarifier or other pretreatment facility;
3. Properly connected to a sanitary sewer.
4. Other features which are comparable and equally effective, as determined by the City Engineer.

f. Outdoor Processing Areas

Outdoor process equipment operations, such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, landfills, waste piles, and wastewater and solid waste treatment and disposal, and other operations determined to potentially threaten water quality by the City of Chula Vista shall adhere to the following requirements.

1. Cover or enclose areas that would be the most significant source of pollutants; or, slope the area toward a dead-end sump; or, discharge to the sanitary sewer system following appropriate treatment in accordance with conditions established by the applicable sewer agency.
2. Grade or berm area to prevent run-on from surrounding areas.
3. Installation of storm drains in areas of equipment repair is prohibited.
4. Other features which are comparable or equally effective, as determined by the City Engineer.

g. Equipment Wash Areas

Outdoor equipment/accessory washing and steam cleaning activities at Priority Development Projects shall:

1. Be self-contained; or covered with a roof or overhang;
2. Be equipped with a clarifier, grease trap or other pretreatment facility, as appropriate;
3. Be properly connected to a sanitary sewer.
4. Other features which are comparable or equally effective as determined by the City Engineer.

h. Parking Areas

To minimize the offsite transport of pollutants from parking areas, the following design concepts shall be considered, and incorporated and implemented where determined applicable and feasible by the City of Chula Vista:

1. Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design.
2. Overflow parking (parking stalls provided in excess of the City of Chula Vista's minimum parking requirements) should be constructed with permeable paving.
3. Other design concepts, which are comparable and equally effective, as determined by the City Engineer.

i. Roadways

Priority roadway projects shall select Treatment Control BMPs following the treatment control selection procedure identified in Section 3.VI.2, "Establish Storm Water BMPs"

j. Fueling Area

Non-retail fuel dispensing areas shall contain the following:

1. Overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area. The fueling area shall drain to the project's Treatment Control BMP(s) prior to discharging to the storm water conveyance system.
2. Portland cement concrete paving (or equivalent smooth impervious surface). The use of asphalt concrete shall be prohibited.
3. Appropriate slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of urban runoff.
4. At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

More stringent standards may be required by other regulating agencies, in which case the development shall meet those more stringent requirements.

k. Hillside Landscaping

Hillside areas, as defined in this Manual, that are disturbed by project development shall be landscaped with deep-routed, drought tolerant plant species selected for erosion control, satisfactory to the City of Chula Vista.

c. Treatment Control BMPs

Minimizing a development's detrimental effects on water quality can be most effectively achieved through the use of a combination of Site Design, Source Control, and Treatment Control storm water BMPs. Where projects have been designed to minimize, to the maximum extent practicable, the introduction of anticipated Pollutants of Concern that may result in significant impacts to the receiving waters through the implementation of Site Design and Source Control storm water BMPs, the development would still have the potential for Pollutants of Concern to enter the storm water conveyance system. Therefore, priority projects shall be designed to remove Pollutants of Concern from the storm water conveyance system to the Maximum Extent Practicable through the incorporation and implementation of Treatment Control BMPs.

In meeting the requirements in this section, Priority Development Projects shall implement a single or combination of storm water BMPs that will remove anticipated Pollutants of Concern, as identified by the procedure in Section 3.VI.1, in site runoff to the Maximum Extent Practicable. Treatment Control BMPs with a high or medium pollutant removal efficiency for the project's most significant Pollutant of Concern shall be selected. The City of Chula Vista may approve Treatment Control BMPs with a low removal efficiency ranking only under exceptional circumstances and after the project proponent has conducted a feasibility analysis which exhibits that implementation of Treatment Control BMPs with a high or medium removal efficiency ranking are infeasible.

Treatment Control BMPs must be implemented unless the City of Chula Vista grants a waiver to the project based on the infeasibility of any Treatment Control BMP.

Step 8: Design to Treatment Control BMP Standards

All priority projects shall design, construct and implement structural Treatment Control BMPs that meet the design standards of this section, unless specifically exempted by the limited exclusions listed at the end of Step 8. Structural Treatment Control BMPs required by this section shall be operational prior to the use of any dependent development, and shall be located and designed in accordance with the requirements here in Step 8 and below in Step 9.

Volume

1. Volume-based BMPs shall be designed to mitigate (infiltrate, filter, or treat):

   i. The volume of runoff produced from a 24-hour 85th percentile storm event, as determined from the local historical rainfall record (0.6 inch approximate average for the San Diego County area)[4]; or,

   ii. The volume of runoff produced by the 85th percentile 24-hour runoff event, determined as the maximized capture urban runoff volume for the area, from the formula recommended in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998*); or,

   iii. The volume of annual runoff based on unit basin storage volume, to achieve 90 percent or more volume treatment by the method recommended in *California Stormwater Best Management Practices Handbook – Industrial/Commercial, (1993);* or,

   iv. The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile 24-hour runoff event.[5]

OR

Flow

2. Flow-based BMPs shall be designed to mitigate (infiltrate, filter, or treat):

   i. The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour for each hour of a storm event; or

   ii. The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two, for each hour of a storm event; or

   iii. The maximum flow rate of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile hourly rainfall intensity multiplied by a factor of two, for each hour of a storm event.

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[4]. This volume is not a single volume to be applied to all of San Diego County. The size of the 85th percentile storm event is different for various parts of the County. The applicant may calculate the 85th percentile storm event using local rain data. In addition, isopluvial maps contained in the County of San Diego Hydrology Manual may be used to extrapolate rainfall data to areas where insufficient data exists. If isopluvial maps are selected, applicants shall describe their method for using isopluvial maps.

[5]. Under this volume criterion, hourly rainfall data may be used to calculate the 85th percentile storm event, where each storm event is identified by its separation from other storm events by at least six hours of no rain. If hourly rainfall data is selected, the applicant shall describe the method using hourly rainfall data.

Limited Exclusions:

1. Proposed restaurants, where the land area for development or redevelopment is less than 5,000 square feet, are excluded from the numerical sizing criteria requirements listed in Section 3.VI.2.c, Step 8.
2. Where significant redevelopment results in an increase of less than 50 percent of the impervious surfaces of a previously existing development and the existing development was not subject to SUSMP requirements, the numeric sizing criteria discussed in Section 3.VI.2.c, Step 8 apply only to the addition, and not to the entire development.

Step 9: Locate BMPs Near Pollutant Sources

Structural Treatment Control storm water BMPs should be implemented close to pollutant sources to minimize costs and maximize pollutant removal prior to runoff entering receiving waters. Such BMPs may be located on- or offsite, used singly or in combination, or shared by multiple new developments, pursuant to the following requirements:

1. All structural treatment control BMPs shall be located so as to infiltrate, filter, and/or treat the required runoff volume or flow prior to its discharge to any receiving water body supporting beneficial uses;
2. Multiple post-construction structural treatment control BMPs for a single Priority Development Project shall collectively be designed to comply with the design standards of Step 8;
3. Shared storm water BMPs shall be operational prior to the use of any dependent development or phase of development. The shared BMPs shall only be required to treat the dependent developments or phases of development that are in use;
4. Interim storm water BMPs that provide equivalent or greater treatment than is required by Step 8 may be implemented by a dependent development until each shared BMP is operational. If interim BMPs are selected, the BMPs shall remain in use until permanent BMPs are operational.

Step 10: Restrictions on Use of Infiltration BMPs

Three factors significantly influence the potential for urban runoff to contaminate ground water. They are (i) pollutant mobility, (ii) pollutant abundance in urban runoff, (iii) and soluble fraction of a pollutant. The risk of contamination of groundwater may be reduced by pretreatment of urban runoff. A discussion of limitations and guidance for infiltration practices is contained in, *Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration, Report No. EPA/600/R-94/051, USEPA (1994).*

To protect groundwater quality, the City of Chula Vista may apply restrictions to the use of any BMPs that are designed to primarily function as infiltration devices (such as infiltration trenches and infiltration basins). As additional ground water basin data is obtained, the City may develop additional restrictions on the use of any BMPs that allow incidental infiltration. At a minimum, use of structural treatment BMPs that are designed to primarily function as infiltration devices shall meet the following conditions[6]:

1. Urban runoff from commercial developments shall undergo pretreatment to remove both physical and chemical contaminants, such as sedimentation or filtration, prior to infiltration.
2. All dry weather flows shall be diverted from infiltration devices except for those non-storm water discharges authorized pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1): diverted stream flows, rising ground waters, uncontaminated ground water infiltration [as defined at 40 CFR 35.2005(20)] to storm water conveyance systems, uncontaminated pumped ground water, foundation drains, springs, water from crawl space pumps, footing drains, air conditioning condensation, flow from riparian habitats and wetlands, water line flushing, landscape irrigation, discharges from potable water sources other than water main breaks, irrigation water, individual residential car washing, and de-chlorinated swimming pool discharges.
3. Pollution prevention and Source Control BMPs shall be implemented at a level appropriate to protect groundwater quality at sites where infiltration structural treatment BMPs are to be used.
4. The vertical distance from the base of any infiltration structural treatment BMP to the seasonal high groundwater mark shall be at least 10 feet or as determined on an individual, site-specific basis by the City of Chula Vista. Where groundwater does not support beneficial uses, this vertical distance criterion may be reduced, provided groundwater quality is maintained.
5. The soil through which infiltration is to occur shall have physical and chemical characteristics (such as appropriate cation exchange capacity, organic content, clay content, and infiltration rate) that are adequate for proper infiltration durations and treatment of urban runoff for the protection of groundwater beneficial uses.
6. Infiltration structural treatment BMPs shall not be used for areas of industrial or light industrial activity; areas subject to high vehicular traffic (25,000 or greater average daily traffic on main roadway or 15,000 or more average daily traffic on any intersecting roadway); automotive repair shops; car washes; fleet storage areas (bus, truck, etc.); nurseries; and other high threat to water quality land uses and activities as designated by the City of Chula Vista.
7. The horizontal distance between any infiltration structural BMP and any water supply wells shall be 100 feet or as determined on an individual, site-specific basis by the City of Chula Vista.

[6]. These conditions do not apply to structural treatment BMPs which allow incidental infiltration and are not designed to primarily function as infiltration devices (such as grassy swales, detention basins, vegetated buffer strips, constructed wetlands, etc.)

Where infiltration BMPs are authorized, their performance shall be evaluated for impacts to groundwater quality. The City of Chula Vista may impose, on a case-by-case basis, additional restrictions on the use of Treatment Control BMPs that are designed to primarily function as infiltration devices. The City will consider the Municipal Permit Section C.1.g. requirements to control the contribution of pollutants from one portion of the watershed to another portion of the watershed through interagency agreements. In those instances where the City may determine that implementation of proposed infiltration BMPs within its jurisdiction has a potential impact to groundwater quality in another jurisdiction, the City may include a notification requirement be placed upon those proposing such use in addition to the above protection measures.

3. Provide Proof of Ongoing Storm Water BMP Maintenance

The City of Chula Vista will not consider structural BMPs to be "effective" and, therefore, shall not accept storm water BMPs as meeting the MEP standard, unless a mechanism is in place that will ensure ongoing long-term maintenance of all structural BMPs. This mechanism can be provided by the City or by the project proponent. As part of project review, if a project proponent is required to include interim or permanent structural BMPs in project plans, and if the City does not provide a mechanism for BMP maintenance (such as the establishment of a Community Facility District, or CFD), the City will require that the applicant provide verification of maintenance requirements through such means as may be appropriate, at the discretion of the City of Chula Vista, including, but not limited to covenants, legal agreements, maintenance agreements, and/or conditional use permits.

Maintenance Mechanisms

1. Public Entity Maintenance: The City of Chula Vista may, at its discretion, approve a public or acceptable quasi-public entity (e.g., the County Flood Control District, or annex to an existing assessment district, an existing utility district, a state or federal resource agency, or a conservation conservancy) to assume responsibility for maintenance, repair and replacement of the BMPs. Unless otherwise approved by the City, public entity maintenance agreements shall ensure estimated costs are front-funded or reliably guaranteed (e.g., through a trust fund, assessment district fees, bond, letter of credit or similar means). In addition, the City may seek protection from liability by appropriate releases and indemnities. Storm water BMPs within the City's jurisdiction proposed for transfer to any other public entity will be subject to approval by the City before installation. The project proponent must take all steps necessary to ensure that the City is involved in the negotiation of maintenance requirements within its jurisdiction with any other public entities accepting maintenance responsibilities; and in negotiations with the resource agencies responsible for issuing permits for the construction and/or maintenance of the facilities. The City must be identified

as a third party beneficiary empowered to enforce any such maintenance agreement within its jurisdiction.

2. Project Proponent Agreement to Maintain Storm Water BMPs: The City may enter into a contract with the project proponent obliging the project proponent and successors to maintain, repair, and replace the storm water BMP as necessary into perpetuity. Security may be required.
3. Assessment Districts: The City may approve an Assessment District or other funding mechanism created by the project proponent to provide funds for storm water BMP maintenance, repair, and replacement on an ongoing basis. Any agreement with such a District shall be subject to the Public Entity Maintenance provisions above.
4. Lease Provisions: In those cases where the City of Chula Vista holds title to the land in question, and the land is being leased to another party for private or public use, the City may assure storm water BMP maintenance, repair, and replacement through conditions in the lease.
5. Conditional Use Permits: For discretionary projects only, the City may assure maintenance of storm water BMPs through the inclusion of maintenance conditions in the Conditional Use Permit. Security may be required.
6. Alternative Mechanisms: The City may in its discretion accept alternative maintenance mechanisms if such mechanisms are as protective as those listed above.

Verification Mechanisms

For discretionary projects, the City-approved method of storm water BMP maintenance shall be incorporated into the project's permit, and shall be consistent with permits issued by resource agencies, before decision-maker approval of discretionary permits. For projects requiring only ministerial permits, the City-approved method of storm water BMP maintenance shall be incorporated into the permit conditions before the issuance of any ministerial permits. In all instances, the project proponent shall provide proof of execution of a City-approved method of maintenance, repair, and replacement before the issuance of construction approvals. For public projects that are not required to obtain permits, a City-approved method of storm water BMP maintenance, repair, and replacement shall be established prior to the commencement of construction. For all properties, the verification mechanism will include the project proponent's signed statement, as part of the project application, accepting responsibility for all structural BMP maintenance, repair and replacement, until a City-approved entity assumes responsibility for structural BMPs maintenance, repair, and replacement.

Maintenance Requirements

1. Inspection, Operation, and Maintenance Plan (IOMP): A copy of an Inspection, Operation, and Maintenance Plan (IOMP), prepared by the project proponent and as approved by the City, shall be included in the Water Quality Technical Report

for the project, and submitted to the City prior to the issuance of a Grading, Construction, or Building Permit; or any other development permit required for the project. The IOMP shall describe the designated responsible party to manage the storm water BMPs, employees' training program and duties, inspection and operating schedule, maintenance frequency, routine service schedule, specific maintenance activities, copies of resource agency permits, and any other necessary activities. At a minimum, maintenance agreements shall require the inspection and servicing of all structural BMPs on an annual basis. The project proponent or City-approved maintenance entity shall complete and maintain IOMP forms to document all maintenance requirements. Parties responsible for the IOMP shall retain records for at least 5 years. These documents shall be made available to the City for inspection upon request at any time.

2. Maintenance Agreement and Access: As described in Section 8 of this Manual, the City will require a maintenance agreement to be signed for the inspection and maintenance of storm water facilities, providing City staff access to BMPs for inspection purposes. The agreement shall run with the land throughout the life of the project, until such time that the storm water BMPs requiring maintenance and access are replaced and maintenance and access are no longer needed, all to the satisfaction of the City of Chula Vista.

4. Waiver of Structural Treatment BMP Requirements

If infeasibility can be demonstrated to the satisfaction of the City Engineer, the project's requirement of implementing structural treatment BMPs "Design to Treatment Control BMP Standards" may be waived by the City Engineer. The City Engineer will only grant a waiver of infeasibility when the City Engineer is satisfied that all available structural treatment BMPs have been considered and appropriately rejected as infeasible. The City Engineer will notify the Regional Board within 5 days of each waiver issued and shall include the name of the person granting each waiver.

Waivers may only be granted as to the requirements for structural treatment BMP and structural treatment BMP sizing requirements. Priority Development Projects, whether or not granted a waiver may not cause or contribute to an exceedance of water quality objectives. Pollutants in runoff from projects granted a waiver must still be reduced to the maximum extent practicable.

The City has the discretion to implement a waiver program. If the City chooses to implement a waiver program, it may also develop a SUSMP waiver impact fee program, to require project proponents who have received waivers to transfer the savings in cost, or a proportionate share thereof, as determined by the City, to a storm water mitigation fund. The City will notify the Regional Board if a SUSMP waiver impact fee program is developed pursuant to this SUSMP. Further details for any SUSMP waiver impact fee program may be set out in supplemental submissions of this SUSMP if multiple jurisdictions establish a joint mitigation fund program for San Diego Bay watershed.

This SUSMP does not preclude the City, acting alone or in partnership with other agencies, from imposing any other fees or charges on development projects that are permitted by law, or from managing or expending the monies received from such non-SUSMP programs in any manner authorized by law.

VII. Resources and References

1. Storm Water Best Management Practices

The following is a list of BMPs that may be used to minimize the introduction of Pollutants of Concern potentially resulting in significant impacts to receiving waters. Other BMPs approved by the City as being equally or more effective in pollutant reduction than comparable BMPs identified below are acceptable. See Section 3.VII.2: *Suggested Resources* for additional sources of information. All BMPs must comply with local zoning and building codes and other applicable regulations.

Site Design BMPs

1. Minimize impervious areas.
2. Reduce sidewalk widths.
3. Incorporate landscaped buffer areas between sidewalks and streets.
4. Design residential streets for the minimum required pavement widths.
5. Minimize the number of residential street cul-de-sacs and incorporate landscaped areas within cul-de-sac centers with curb-cuts to reduce their impervious cover.
6. Use open space development that incorporates smaller lot sizes.
7. Increase building density while decreasing the building footprint.
8. Reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.
9. Reduce overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.
10. Increase rainfall infiltration.
11. Use permeable materials for private sidewalks, driveways, parking lots, and interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).
12. Use curb-cuts to direct pavement runoff into swales, landscaping, and natural areas prior to entering the MS4.
13. Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the urban runoff conveyance system.

14. Pitch driveways and parking areas toward yards and vegetated areas prior to draining into the MS4.
15. Conserve and utilize natural soils and/or use amended soils to encourage light infiltration/ percolation.
16. Minimize disturbances to natural drainages.
17. Minimize soil compaction in planned green space (landscaped areas, lawns, etc.) and re-till soils when compacted by grading/construction equipment.
18. Maximize rainfall interception.
19. Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.
20. Cisterns/Rain barrels.
21. Foundation landscaping.

Minimize Directly Connected Impervious Areas (DCIAs):

1. Drain rooftops into adjacent landscaping prior to discharging to the storm drain.
2. Use curb-cuts to allow parking lots to drain into landscape areas co-designed as biofiltration areas and/or swales prior to draining into the MS4.
3. Drain roads, sidewalks, and impervious trails into adjacent landscaping.
4. Slope and channel protection.
5. Use natural drainage systems to the maximum extent practicable.
6. Stabilized permanent channel crossings.
7. Plant native or drought tolerant vegetation on slopes.
8. Energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels.

Source Control BMPs

1. Storm drain system stenciling and signage.
2. Outdoor material and trash storage area designed to reduce or control rainfall runoff.
3. Efficient irrigation system.

Treatment Control BMPs

1. Biofilters
2. Bioretention Swale (detains and infiltrates water through soil)
3. Storm Water Planter Box (open-bottomed)
4. Storm Water Flow-Through Planter (sealed bottom)

5. Vegetated filter strip
6. Bioretention Area
7. Vegetated Roofs/Modules/Walls
8. Detention Basins
9. Extended/dry detention basin with grass/vegetated lining
10. Extended/dry detention basin with impervious lining

Infiltration Facilities

1. Infiltration basin
2. Infiltration trench
3. Dry well
4. Permeable paving
5. Gravel
6. Permeable asphalt
7. Pervious concrete
8. Unit pavers, ungrouted, set on sand or gravel
9. Subsurface Reservoir Bed

Wet Ponds and Wetlands

1. Wet pond (permanent pool)
2. Constructed wetland

Filtration Systems

1. Media filtration
2. Sand filtration

Hydrodynamic Separation Systems

1. Swirl Concentrator
2. Cyclone Separator

Trash Racks and Screens